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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/022,058	12/13/2001	Mingxian Huang	ART-00106.P.1.1	5669

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EXAMINER	
LAM, ANN Y	

ART UNIT	PAPER NUMBER
1641	

DATE MAILED: 12/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/022,058	HUANG ET AL.	
	Examiner	Art Unit	
	Ann Y. Lam	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 6, 2005 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, lines 7-8, recites "wherein said coating film comprises particulate particles that are heterogeneous with said coating film". The phrase appears to be reciting that the particulate particles are heterogenous with itself because the claim recites that the coating film comprises the particles and does not mention that it comprises anything else. For purposes of examination, the Office will interpret the claim

to mean that the coating film comprises a material and particulate particles, wherein the particulate particles are heterogeneous with the material.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pourahmadi et al., 6,440,725, in view of Borrelli et al., 6,350,618.

Pourahmadi et al. discloses the invention substantially as claimed, except for the coating film comprising a particulate particle.

Pourahmadi et al. discloses the invention substantially as follows. Pourahmadi et al. discloses a platform comprising:

a surface (i.e., surfaces of chamber 26, e.g., 22 or 24, see col. 24, lines 57-58) (or alternatively, 88);

a coating film (i.e., coating of a substance, such as polymers, having high binding affinity with a target analyte, col. 24, lines 59-63);

a channel structure (26, see fig. 6, and col. 24, line 58);

wherein said coating film defines in part said channel structure (26, see fig. 6, and col. 24, line 58;

wherein said platform comprises a microchip (col. 2, lines 58-63).

Pourahmadi et al. teaches that the internal surfaces of chamber walls may be coated with a substance such as polymers having a high binding affinity with the target analyte (col. 24, lines 57-63). However, Pourahmadi et al. does not teach that the coating comprises a particulate particle. Borrelli et al. teach this limitation however.

Borrelli et al. teach that liquid suspension including biomolecules covalently attached to beads may be used along with a resin to fill the channels and become part of a polymer network upon curing (col. 17, lines 50-54). The biomolecules are binding entities such as DNA or antibodies (col. 10, line 64 – col. 11, line 16) for diagnostic purposes (col. 1, lines 31-33, and lines 52-53). Borrelli et al. teach that the resin comprises a polymer such as an epoxy resin (col. 16, lines 60-62). Borrelli et al. teach that such a method provides a crosslinked polymer network with binding entities inside a channel (col. 16, lines 60-66.) Borrelli et al. also teach that the channels may contain reagents, chromatographic chemistries or any other organic or inorganic material that can either polymerize, bond to the channel interior walls, or is capable of being frozen and cut (col. 17, lines 56-60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a film comprising a polymer with beads attached with biomolecules as the binding substance that is generally disclosed by Pourahmadi et al. because Borrelli et al. teach that the technique provides the advantage of creating a

crosslinked polymer network with biomolecules inside the channels for chromatography chemistries.

As to the following claims, Pourahmadi et al. teach the limitations as follows.

As to claim 2, the surface (e.g., 22 or 24) comprise at least in part glass or polymer (col. 22, line 53).

As to claim 3, the surface comprises an acoustic element (i.e., ultrasonic transducer, 88, col. 33, lines 57-58.)

As to claim 6, the coating film comprises a polymer (col. 24, line 61.)

As to claim 7, the coating film comprises a hydrophobic polymer or a hydrophilic polymer (col. 24, line 62).

As to claim 8, the coating film comprises polysaccharides (col. 11, line 9.) The Office notes that binding entities are not claimed in claim 8. Thus, the polysaccharides in column 11, line 9 are considered part of the coating film.

As to claim 9, the coating film is biocompatible (col. 24, lines 59-60).

As to claim 12, the coating film comprises at least in part a biological group (e.g., nucleic acid, col. 25, lines 21-22).

As to claim13, the biological group is a nucleic acid (col. 25, lines 21-22).

As to claim 14, the biological group (i.e., nucleic acid, col. 25, lines 21-22) is capable of interacting with a biological moiety or chemical moiety by electrostatic interactions, ionic interactions, hydrogen boding or hydrophobic interactions (col. 25, lines 21-22).

As to claim 15, the biological group interacts with a biological moiety by nucleic acid-nucleic acid interactions (col. 25, lines 21.22).

As to claims 16 and 20, the biological group is present substantially throughout said coating film or on the surface of said coating film (col. 25, lines 21-22).

As to claim 17, the coating film comprises at least in part a chemical group (col. 25, lines 21-22).

As to claim 18, the chemical group comprises at least in part an alkyl group, a charged group, or small molecules or combinations thereof (col. 25, lines 21-22.)

As to claim 19, the chemical group (i.e., nucleic acid, col. 25, lines 21-22, or alternatively, antibody, see col. 17, line 39) is capable of interacting with a chemical moiety or biological moiety by electrostatic interactions, ionic interactions, hydrogen bonding, hydrophobic interactions or covalent linking.

As to claim 28, the channel structure (26) comprise open channels or closed channels (see fig. 6.)

As to claim 29, at least a portion of said channel structure (26) is defined by said surface (22, see fig. 6).

As to claim 30, at least a portion of said channel structure is defined by said coating film (col. 24, lines 58-60).

As to claim 32, the channel structures (26) form at least one island (see fig. 6).

As to claim 33, said channel structure (26) has a shape in cross section that is substantially rectangular (see fig. 6.)

As to claim 34, the channel structure is linear (see fig. 6.)

As to claim 35, the device further comprises an acoustic element (i.e., ultrasonic transducer, 88, col. 33, lines 57-58), or magnetic element (i.e., magnetic beads (col. 18, line 43.)

As to the following claims, Borrelli et al. teach the limitations as follows.

As to claim 23, the particles comprise a polymer (col. 16, lines 61-62.)

As to claim 25, the particles are biocompatible (col. 16, lines 61-62.)

As to claims 26 and 27, the particles comprise at least in part a biological group or chemical group (col. 17, lines 51-52.)

As to claim 31, the channel structure can be formed by selective polymerization of the coating film.

Also, neither Pourahmadi et al. nor Borrelli et al. disclose the dimension of the surface length or width or thickness as claimed by Applicant (in claims 4, 5, 10 and 11), nor that the particles comprise between about 0.1% and bout 99.9 % volume of the polymer coating (claim 22), nor the size of the particle as claimed by Applicant. However, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. In this case, Pourahmadi et al. in view of Borrelli et al. disclose the general conditions of the claim, and the ranges in dimensions as claimed by Applicant are optimum or workable ranges and thus involve only routine skill in the art according to *In re Aller.*

Response to Arguments

Applicant's arguments filed September 6, 2005 have been considered but are moot in view of the new grounds of rejections.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Burdon et al., 6,572,830, disclose a sheet of inorganic particles of glass dispersed in a polymer binder (col. 6, line 66 – col. 7, line 2).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ann Y. Lam whose telephone number is 571-272-0822. The examiner can normally be reached on M-Sat 11-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LONG V. LE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600
12/09/05